

*PROBLEM BEHAVIOR DURING PREFERENCE ASSESSMENTS: AN  
EMPIRICAL ANALYSIS AND PRACTICAL RECOMMENDATIONS*

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Preferences of 2 children with developmental disabilities, whose functional analyses indicated that their problem behavior was maintained by access to tangible items, were assessed using three formats (i.e., paired stimulus [PS], multiple-stimulus without replacement [MSWO], and free operant [FO]). The experimenter administered each format five times and compared levels of problem behavior across formats in a multielement design. Both participants exhibited problem behavior in PS and MSWO formats but not in the FO format. Results are discussed in terms of recommendations for practitioners.

*Key words:* autism, problem behavior, developmental disability, ecological validity, preference assessment

Several systematic preference assessment formats have been described in the literature and have a research base supporting their use (e.g., paired stimulus [PS], multiple-stimulus without replacement [MSWO], and free operant [FO]; Daly et al., 2009; DeLeon & Iwata, 1996; Fisher et al., 1992; Roane, Vollmer, Ringdahl, & Marcus, 1998). Tangible items identified via these systematic preference assessments are more likely to have reinforcing value than those chosen arbitrarily (Dyer, 1987). Each of these formats has slightly different procedures. The participant selects one item at a time in the PS and MSWO formats. The experimenter then removes the selected item from the participant after a brief period. The major difference between PS and MSWO formats is that the experimenter presents two items at a time in PS assessment and three or more in MSWO assessment. In the FO format, the experimenter presents the entire group of items as an array, and the participant may access the array and manipulate one, multiple, or no items at all. In

addition, the experimenter does not remove items from the participant.

DeLeon and Iwata (1996) suggested that the MSWO format predicts the extent to which stimuli function as reinforcement as accurately as the PS format, but requires less time to complete. Roane et al. (1998) reported that participants exhibited higher levels of problem behavior during PS than during FO formats and hypothesized that problem behavior during the PS format may be maintained by access to preferred items and evoked by the removal of these items during assessment. This difference in observed responding is an issue, because problem behavior may interrupt the assessment and could lead ultimately to inaccurate results. Therefore, Roane et al. suggested that the FO assessment may be preferable when an individual's problem behavior is maintained by access to preferred items, because the FO assessment does not require the experimenter to remove items from the participant, as is the case for the PS and MSWO assessments. However, Roane et al. advised caution in interpreting their results because they did not conduct a functional analysis prior to these preference assessments. Therefore, it was not certain if the problem behavior that occurred during the PS format was related to a tangible positive reinforcement function.

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The current study replicated and extended Roane et al. (1998) by (a) comparing the rates of problem behavior across preference assessment formats, (b) including another commonly used preference assessment format (i.e., MSWO) in the comparison, and (c) conducting a functional analysis to demonstrate empirically the function of problem behavior for each participant.

## METHOD

### *Participants*

Britton and Mason were 6-year-old boys who had been diagnosed with autism. Mason had also been diagnosed with moderate intellectual disability, Chiari malformation Type I, and hypothyroidism.

### *Dependent Variables and Data Collection*

Britton's problem behavior was throwing objects, and Mason's were pinching, biting, scratching, and crying. Behaviors were recorded using a 10-s partial-interval measure during the functional analysis and a frequency within 10-s intervals measure for the preference assessment. This frequency was converted to a rate (responses per minute) by dividing the total number of problem behaviors that occurred during the assessment by the duration of the assessment (in minutes). All sessions were videotaped.

### *Interobserver Agreement*

Interobserver agreement during the functional analysis was conducted on 30% of sessions for each participant and was calculated by dividing the number of intervals in which both observers agreed on the occurrence or nonoccurrence of the behavior by the total number of intervals (agreements plus disagreements). This ratio was converted to a percentage. Mean agreement was 94% (range, 88% to 100%).

Interobserver agreement during the preference assessment was conducted on 20% of sessions and was calculated by dividing the

number of intervals in which both observers agreed (same frequency of behavior within an interval) by the total number of intervals (agreements plus disagreements). This ratio was converted to a percentage. Mean agreement was 97% (range, 93% to 100%).

### *Procedure*

*Functional analysis.* The functions of problem behaviors were identified via a functional analysis (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994) conducted by the fourth author in an empty classroom at the participants' school. The experimenter conducted attention, tangible, escape, and free-play conditions following a multielement design format.

*Preference assessment.* The teacher identified preferred items for the functional analysis and preference assessments. The first author implemented the preference assessments (i.e., PS, Fisher et al., 1992; MSWO, DeLeon et al., 2001; FO, Roane et al., 1998). In the PS format, the implementer presented an item pair and asked the participant to choose one in each trial. After brief access, the implementer took the item back and presented a new pair in the same manner. In the MSWO format, the implementer presented all items and asked the participant to choose one. After the participant manipulated the selected item briefly, the implementer removed the item from the participant and from the array and instructed the participant to choose from the remaining items. In the FO format, the implementer presented all items. The participant was free to manipulate any items or none at all for 5 min. The implementer moved away from the participant and did not interact with the participant or the items.

The experimenter administered each format five times per participant. The items used in the preference assessments and the time of administration were held constant throughout the study. The implementer administered one preference assessment for each participant per day. A multielement design was used to

compare the rates of problem behaviors across the three preference assessment formats.

## RESULTS AND DISCUSSION

Britton's problem behavior occurred only in the tangible condition and never occurred in the attention, escape, or play conditions. The percentage of intervals of Mason's problem behavior was highest in the tangible condition ( $M = 8.3\%$ ), followed by the escape ( $M = 3\%$ ), attention ( $M = 1.3\%$ ), and play ( $M = 0.7\%$ ) conditions.

Figure 1 displays the rates of problem behavior during each of the preference assessments. Mean rates for Britton were 2.08, 1.12, and 0 for PS, MSWO, and FO, respectively. Mean rates for Mason were 1.96, 0.48, and 0 for MSWO, PS, and FO, respectively.

A within-session analysis was conducted to evaluate when problem behavior occurred during PS and MSWO sessions. Specifically, we examined the frequency of problem behavior via the video recording of the preference assessments when (a) the implementer asked the participant to choose between items, (b) the participant had access to the items, and (c) the implementer withdrew the chosen item from the participant. The mean percentage of problem behavior that occurred during intervals in which the experimenter removed a chosen item was 98% (range, 90% to 100%), which was calculated by dividing the number of problem behaviors that occurred when the implementer withdrew a chosen item by the total number of problem behaviors during the entire assessment session. This ratio was converted to a percentage. The percentage of problem behavior that occurred following the experimenter instructing the participant to choose between items was 2%. Problem behavior never occurred when participants had access to items.

The results of the current study support the hypothesis proposed by Roane et al. (1998) in several ways. First, the study was conducted

with individuals whose problem behavior was maintained by tangible positive reinforcement. Second, higher rates of problem behavior occurred in PS and MSWO assessments than in FO assessments. In addition, problem behavior occurred following the removal of items and did not occur when the participants had access to them, further supporting the relation between the tangible positive reinforcement function of problem behavior and the preference assessment format.

The current findings and those of Roane et al. (1998) suggest that it may be preferable to use the FO format to assess preferences for individuals whose problem behavior is maintained by access to tangible items. Second, switching to the FO format may be one possible solution in the event that high levels of problem behavior occur during the initial preference assessment.

Readers should note that the availability of resources (Hagopian, Long, & Rush, 2004), the duration of administration time (DeLeon & Iwata, 1996; Roane et al., 1998), and the extent to which each format is able to produce a hierarchy of stimulus preferences should be considered when selecting which preference assessment format to employ. Second, it may be that the longer time required to implement the PS format as opposed to the FO format could have contributed to the rate of problem behavior. However, the length of the MSWO format was shorter ( $M = 3$  min) than the length of the FO format ( $M = 5$  min), yet the rates of problem behavior in the MSWO format were higher than in the FO format.

Finally, this study did not examine the occurrence of problem behavior maintained by other functions (e.g., attention or escape) across the preference assessment formats. Therefore, it is possible, regardless of what function problem behavior serves, that the PS and MSWO formats may evoke more problem behavior. However, given that problem behavior occurred most often immediately following the removal

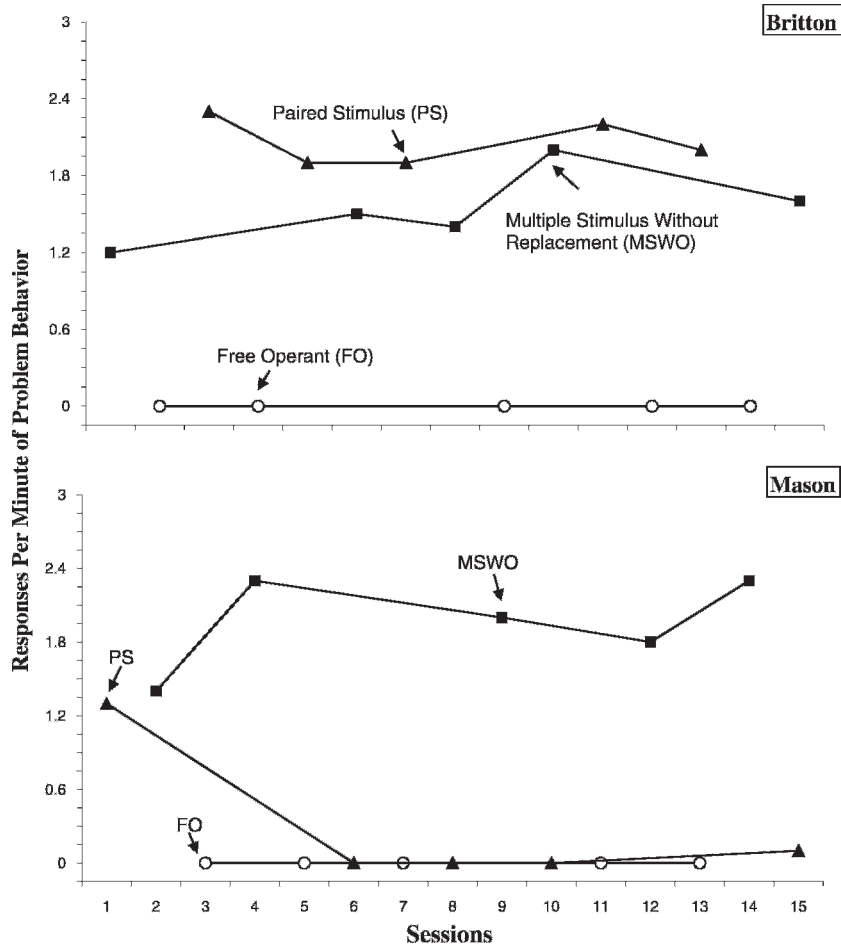


Figure 1. Responses per minute of problem behavior during the PS, MSWO, and FO preference assessments.

of items, the tangible function likely plays some role in its occurrence. Given this likelihood, future research that examines the potential relation between other functions of problem behavior and particular preference assessment formats could be informative.

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